

Dennis B. Bilik, P.E.

Concrete Unicorn • Civil Engineer • QA/QC Leader • AI Infrastructure Builder

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PE Illinois #062061516 • PE California #80906

PROFESSIONAL SUMMARY

Results-driven Civil Engineer and QA/QC leader with 21+ years in heavy civil infrastructure. Primary QA/QC owner for the Metropolitan Water Reclamation District of Greater Chicago's capital improvement program as it scaled from \$339M (2018) to \$855M (2026). Modernized long-stagnant programs: first concrete specification rewrite since 2002, in-house materials lab (AASHTO target), drone QA program, and multi-LLM adversarial submittal review pipeline. Dual PE (IL/CA), AMPP PCS, AWS CWI. Open to relocation or remote roles advancing resilient, low-carbon infrastructure.

SELECTED IMPACTS

- 5x per-capita submittal review throughput (pre-AI internal benchmark) vs. peer functions
- ~\$6,000/yr direct savings + eliminated self-insured liability by replacing nuclear density gauges with Troxler eGauges
- 20% ongoing cost reduction via ACI-compliant concrete cylinder storage system
- \$15,000+/yr personal investment in critical testing equipment during rapid CIP growth to bridge procurement gaps

PROFESSIONAL EXPERIENCE

Quality Assurance / Quality Control Coordinator

Metropolitan Water Reclamation District of Greater Chicago • Chicago, IL • December 2017 – Present

- Lead 4-person QA/QC section + specialty consultants for \$855M+ annual CIP; inspection/testing across concrete, metals, protective coatings, and soils on all construction contracts.
- Authored and implemented first MWRD concrete specification rewrite since 2002 — prescriptive to performance-based, ACI-aligned — improving industry compliance and enabling modern technologies including Type 1L cement rollout supporting net-zero goals.
- Designed, procured, and stood up full in-house concrete materials testing laboratory (Humboldt compression machine, cylinder end grinder, curing infrastructure); targeting AMRL/AASHTO accreditation.
- Launched MWRD UAS/drone program end-to-end (aircraft procurement, FAA Part 107 authorization, SOPs, field deployment) for QA/QC documentation and progress tracking.
- Deploying multi-platform adversarial LLM review system (Claude, ChatGPT, Gemini, Grok, Perplexity + custom Python/Claude Agent SDK workflows) for submittals, welding, coatings, and project triage.
- Replaced legacy nuclear density gauges with Troxler 4540 eGauges, eliminating decades-old agency radioactive materials license (~\$6K/yr savings + liability reduction for self-insured entity).
- Introduced Microsoft Teams and dedicated QA/QC tracking software in 2019 — predating broader agency adoption.
- Centralized forecasting of section-wide certifications, training, budget, and equipment needs; replacement costs have fallen since implementation, and in-house repair/calibration keeps division equipment current without budget increases.
- Proposing a 10-year concrete durability longitudinal study with a UIC faculty team — paired AI/ML implementation for specimen data, environmental-exposure tracking, and in-service performance prediction across wastewater-specific attack vectors (biogenic sulfuric acid / MICC and sulfate attack); ties directly to self-insured durability risk on Type 1L and other low-CO₂ binders.

Construction Field Engineer

Metropolitan Water Reclamation District of Greater Chicago • 2011 – 2017

- Field engineering and inspection support on major capital improvement contracts (see Selected Projects).

Design Engineer, Tunnel and Reservoir Project (TARP) Section

Metropolitan Water Reclamation District of Greater Chicago • 2008 – 2011

- Hydraulic and structural design on MWRD's deep-tunnel system.

Construction Field Engineer

EarthTech • Chicago, IL • 2006 – 2008

- Inspection oversight for heavy civil and transportation projects. Coordinated QA/QC for 400+ of 616 prestressed/post-tensioned bulb-tee beams produced for the Des Plaines River Valley Bridge (I-355 South Extension).

Design Engineer

SPACECO, Inc. • Rosemont, IL • 2004 – 2006

- Site civil design for residential, commercial, industrial, and roadway projects. Cost estimates, permit applications, earthwork, grading, utilities, specifications, and stormwater management.

Field Inspector

Harry O. Hefter-Associates Inc. • Chicago, IL • 2001 – 2003

- Inspected contractor work on urban transportation projects including Chicago Skyway 106th Street Viaduct and major avenue resurfacing programs.

Concrete Lab Assistant

University of Illinois at Chicago • 2001 – 2004

- Supported research on CFRP rehabilitation of bridge girders and latex-modified concrete for bridge deck overlays. Built/tested specimens and assisted PhD/graduate students.

SELECTED PROJECTS

39th Street Conduit Rehabilitation – Phase I Bypass Tunnel • \$154M

Design/construction support for ~14,470 LF of 15-ft ID lined tunnel, six deep drop shafts (7–20 ft dia., up to 250 ft deep), connecting structures, gate replacements, and louver additions at 25 existing drop shafts.

O'Brien (North Side) WRP UV Disinfection Facility • \$61.7M (ACEC-IL Honor Award, 2017)

Associate Civil Engineer, Sept 2013 – Dec 2017. 450 MGD, 896-lamp low-pressure high-output UV — largest wastewater UV installation in the world; serves 1.3M across 143 sq mi. Assistant RE duties: daily field activity oversight, inspector scheduling, personal QA/QC inspections. Led forensic retrieval of the May 2015 open-cut SOE failure that compromised the CTA Yellow Line embankment; coordinated evidence preservation and safe re-excavation with Walsh Construction, CTA, and investigators. Commissioned Spring 2016.

Des Plaines River Valley Bridge, I-355 South Extension • \$125M (Illinois Tollway)

Field inspection and precast QA/QC coordination for Illinois' first post-tensioned spliced bulb-tee girder bridge and 2nd-longest bridge in the state (616 beams, spans to 270 ft, individual beams up to 256,000 lb). Crossing two roadways, two railroads, a river, canals, and wetlands.

ACEC-Indiana Engineering Excellence "Honor" Award (2009), via Janssen & Spaans Engineering. Featured in ASPIRE Magazine, Spring 2008.

McCook Reservoir Des Plaines Inflow Tunnel • \$31.3M

~5,700 LF of 20-ft dia. concrete-lined tunnel, gate shaft with primary/backup gates, high-wall stabilization, energy-dissipation apron, and live connection to operating Des Plaines system.

North Branch Chicago River Restoration (Montrose to Berteau) • \$3.2M

Resident Engineer for barge-delivered installation of 1,300 LF sheet pile wall, articulated concrete block mat, riprap, and backfill using Giken hydraulic pile-jacking machine.

EDUCATION

M.S., Construction Engineering & Management — University of Illinois at Chicago • Expected May 2026

B.S., Civil and Materials Engineering — University of Illinois at Chicago • 2004

Doctoral studies in progress (coursework nearly complete); research phase structured for remote execution with focus on concrete durability in wastewater environments (MICC/sulfate attack).

LICENSES & CERTIFICATIONS

PE Illinois #062061516 • PE California #80906 • AMPP Protective Coatings Specialist (PCS 2024-117-531) • AMPP Senior Coatings Inspector #106911 • AMPP CCI Level 2 • AWS Certified Welding Inspector (CWI #25012451) • FAA Part 107 Remote Pilot #4941887 • OSHA 30-Hour Construction • MSHA Part 48 New Miner • ACI Self-Consolidating Concrete Technician (valid through 2029) • ACI Concrete Field Testing Technician Grade I (valid through 2028) • IDOT Hot Mix Asphalt Level 3 • IDOT QC/QA Aggregate & Nuclear Density Technician

TECHNICAL PROFICIENCIES

Engineering & Construction: eBuilder • Trimble • AutoCAD • MicroStation • Constructware • Hydraflow • SWMM • HEC-RAS • HY-8 • TR-20 • Paydirt

Data Science & AI: Python (scikit-learn, neural networks, NLP, SHAP) • Multi-LLM adversarial review pipelines (Claude, ChatGPT, Gemini, Grok, Perplexity) • Custom agent workflows for welding/coatings/concrete review

Inspection & Testing: Concrete technology (ACI) • Protective coatings (AMPP) • Welding inspection (AWS) • Soils & geotechnical • IDOT-certified HMA/Aggregate/Nuclear

ADDITIONAL

Eagle Scout, Boy Scouts of America (March 1999)

Full interactive resume, project details, and steganographic DOCX (password-protected LSB payload in meadow.png) available at bettertodionmars.com